User:

Wednesday, 1/18/2006 4:04:01 PM

Kim Johnston

Process Sheet





HIGH AFT X-TUBE 412

Customer

P.O. Number

: CU-DAR001 Dart Helicopters Services

Job Number **Estimate Number**

: 25551

: 10559 :NIA

This Issue

Checked & Approved By

: 1/18/2006

S.O. No. : NA

: NC : NIA

: 25550

Type

: LANDING GEAR

Part Number

Drawing Name

: D412664203

Drawing Number

: D412-664-243 REV B : N/A

Project Number **Drawing Revision**

: B :NIA

Material **Due Date**

: 2/20/2006

Qty:

Each 1 Um:

Written By

Comment

Prsht Rev.

First Issue

Previous Run

COMMENT BELOW ABOVE DATE EUSEIC

Reformat; Added D3189-1 K/DS : Est Rev:E 04.02.16

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description:

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D412-664-203 CHG 003

06-00-23

mL06/01/31

2.0

1.0

D6009129

Crosstube Material



1.0000 Each(s)/Unit Total:

1.0000 Each(s)

Pick:

Comment: Qty.:

Qty Part number Description Batch

Check OD = 3.500"; ID = 2.250"

1 D6009-129 Crosstube **B**21024

3.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166

2-Turn first side as per Folio FA166

an/06/01/31

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243.

4.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET



Dart Ae	rospace	e Ltd							
W/O:			WORK O	RDER CHANGES					
DATE	STEP	PRO	OCEDURE CHANGE		Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
			· ·						
-						-			
Part No	:	PAR #:	Fault Category:	NC	R: Yes 1	lo DQ	A :	Date: _	
					QA: N/	C Closed	d:	_ Date: _	
NCR:		V	WORK ORDER NO	N-CONFORMANCE	(NCR		*		
DATE	CTED	Description of NC	Corrective Action Section			Verific	ation	Approval	Approval
DATE	STEP	Section A	Initial Ac	tion Description Chief Eng	Sign & Date	Section		Chief Eng	QC Inspector
				۲					

Wednesday, 1/18/2006 4:04:01 PM Date: User: . Kim Johnston **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 . Customer: CU-DAR001 Dart Helicopters Services Job Number: 25551 Part Number: D412664203 Job Number: Description: **Machine Or Operation:** Seq. #: MORI SEIKI CNC LATHE LARGE MORI SEIKI 5.0 Comment: MORI SEIKI CNC LATHE LARGE 1-Turn second side as per Folio FA166 2-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243. 3-Polish entire outside surface of crosstube ml oglostor 4- Remove sand and plugs 5-Scribe part # and batch # using vibrating stylus as per Dwg D412-664-243 INSPECT ALL DIM TO DIM SHEET QC1 6.0 Comment: INSPECT ALL DIM TO DIM SHEET SECOND CHECK QC8 7.0 Comment: SECOND CHECK HAND FINISHING1 HAND FINISHING RESOURCE #1 8.0 Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1 INSPECT WORK/WING WALK 9.0 QC3/5 Comment: Inspect work & Chemical conversion Coat 10.0 BENDING Comment: BENDING MACHINE Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010 DIMENSIONAL CHECK 11.0 Comment: DIMENSIONAL CHECK

W/O:			WORK ORDER CHA	NGES				
DATE	STEP	Р	ROCEDURE CHANGE	Ву	By Date		Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No:	PAR #:	Fault Category:	NCR: Yes No DQA:	Date:	
	•		QA: N/C Closed:	Date:	_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
		Description of NC	.	Corrective Action Section B		Verification	Ammerical	Ammarai	
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Approval Chief Eng	Approval	
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-			•			A Link	100 gr		
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Wednesday, 1/18/2006 4:04:02 PM Date: User: Kim Johnston **⊪Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664203 Job Number: 25551 Job Number: Description: Seq. #: Machine Or Operation: LANDING GEAR 1 LANDING GEAR RESOURCE 1 12.0 Comment: LANDING GEAR RESOURCE 1 1-Drill pilot holes in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551 (// / 06-02-150) 2-Ream hole to finish size in tube as per Dwg D412-664-243using drill Jig DT8550 & DT8551.Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes. 3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243 $\% \sim 0$ 6 -62 - (5,4) HAND FINISHING RESOURCE #1 13.0 HAND FINISHING Comment: HAND FINISHING RESOURCE #1 OK OZ 16 Chemical Conversion Coat as per QSI 005 4.1 **OUTSIDE SERVICES** 14.0 Comment: Sub-Contracting OUTSIDE SERVICES Liquid Penetrant Inspection as per QSI 038Or 06-02-67 U_ Issue P/O: LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order PACKAGING RESOURCE #1 15.0 PACKAGING 1 Comment: PACKAGING RESOURCE #1 Inspect for transit damage C206/02/21 Ensure copy of NDT results attached to work order. DIMENSIONAL CHECK 16.0 QC6 Comment: Inspect for damage & ensure results are as per Dwg D412-664-203 SPRAY PAINTING 17.0 Comment: SPRAY PAINTING 1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2 0

Form: rprocess

Page 3

W/O:		WORK ORDER CHA	ANGES				
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No	•	PAR #: Fault Category:	NCR: Yes	No DQ	- ' A:	Date:	

QA: N/C Closed: ____ Date: ___

NCR:		V	WORK ORDER NON-CONFORMANCE (NCR)								
		Description of NC	-	Corrective Action Section B		Verification	Annanal	A			
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Date: Wednesday, 1/18/2006 4:04:02 PM User: Kim Johnston **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 . Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664203 Job Number: 25551 Job Number: Description: Seq. #: **Machine Or Operation:** Inspect Spray Paint 18.0 Comment: Inspect Spray Paint Wrap in plastic bag to protect from scratches 19.0 Abrasion Strip 1.7640 f(s)/Unit Total: 1.7640 f(s) Comment: Qty.: Pick: Qty Part number Description Batch 2 D2856-600(Cut to 10.090") Abrasion Strip <u>13</u> D2856600 20.0 Comment: Qty.: 1.0080 f(s)/Unit Total: 1.0080 f(s) Pick: Batch Qty Part number Description 2 D2856-600(Cut to 10.870") Abrasion Strip 13 24328 21.0 D28961 Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s) Pick: Qty Part number **Description Batch** 1 D2896-1 Support 1/2 D31891 22.0 Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s) Pick: Description Batch Qty Part number 2 D3189-1 Chafing Sheild B2175 MS2192028 23.0 4.0000 Each(s)/Unit Total: 4.0000 Each(s) Comment: Qty.: Qty Part number Description Batch 4 MS21920-28 Clamp <u>M17700</u>

W/O:				WORK O	RDER CHAN	GES			***	
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Part No	- <u> </u>):	P	AR #:	Fault Category:		NCR: Yes	No DQ	Δ.	Date:	

QA: N/C Closed: ____ Date: __

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Wednesday, 1/18/2006 4:04:02 PM Date: User: · Kim Johnston **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 · Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664203 Job Number: 25551 Job Number: Description: Seq. #: **Machine Or Operation:** Clamp MS2192030 24.0 2.0000 Each(s) Comment: Qty.: 2.0000 Each(s)/Unit Total: Pick: Qty Part number **Description Batch** 2 MS21920-30 25.0 QC5 Comment: INSPECT WORK TO CURRENT STEP PACKAGING RESOURCE #1 PACKAGING 1 26.0 Comment: PACKAGING RESOURCE #1 Pick Packing Kit AN640A 27.0 Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s) Pick:Packing Kit Description Batch -Qty Part number Bolt M18254 4 70 AN6-40a AN641A Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s) Pick:Packing Kit Description Batch Qty Part number Bolt M17231 ¥ AN6-41A AN960JD616 Washer Comment: Qty.: 18.0000 Each(s)/Unit Total: 18.0000 Each(s) Pick:Packing Kit Qty Part number Description Batch 16 AN960JD616 Washer <u>Yn18/0€ M19078</u> MS21042L6 6.0000 Each(s)/Unit Total: 6.0000 Each(s) Comment: Qty.: Pick:Packing Kit Qty Part number Description Batch C 206/02/27 / M19099 6 MS21042L6 Nut Page 5

W/O:			WORK ORDER C	HANGES				
DATE	STEP	PRO	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
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Part No	:	PAR #:	Fault Category:	NCR: Yes	No DQ	A: <u></u>	Date: <u>△</u>	663101

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NCR:			WORK ORD	ER NON-CONFORMANO	E (NCR)			
		Description of NC		Corrective Action Section B		Verification	Approval	Annroyal
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	Approval QC Inspecto
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. Date: Wednesday, 1/18/2006 4:04:02 PM User: · Kim Johnston **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 . Customer: CU-DAR001 Dart Helicopters Services Job Number: 25551 Part Number: D412664203 Job Number: Seq. #: Description: **Machine Or Operation:** INSPECT 100% KITS FOR COMPLETENESS QC4 31.0 Comment: INSPECT 100% KITS FOR COMPLETENESS PACKAGING RESOURCE #1 32.0 PACKAGING 1 Identify and pack for shipping as per PPP D412-664-203 C 206102128 (PPP Rev: DOCUMENT CONTROL 33.0 DÇ Comment: DOCUMENT CONTROL Inspection Level 21 p6.030l Job Completion

Form: rprocess

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W/O:		WORK ORDER CH	ANGES	***			
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No	•	PAR #: Fault Category:	NCR: Yes	No DO	Δ.	Date:	

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DART AEROSPACE LTD	Work Order:	2555
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: A1		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

X First Article Prototype

Inspection Sheet		Tolerance	Actual	Accept	Reject	Method of	Comments	
Dr	awing Dimension	lolerance	Dimension	Accept	i Kojeot	Inspection		
	2.684	+0.005/-0.000	2.687	~				
	2.748	+0.005/-0.000	2.753					
	2.884	+0.005/-0.000	2.889	· -				
	3.019	+0.005/-0.000	3.024					
	3.163	+0.005/-0.000	2.168					
	3.308	+0.005/-0.000	3,312					
	3.429	+0.005/-0.000	3.433					
В	2.990	+0.005/-0.000	2.991	j				
SIDE	2.618	+0.005/-0.000	2.622)				
0,								
	0.200	+/-0.010	0.205					
	R0.063	+/-0.010	RO.063					
	R0.500	+/-0.010	R0.500					
	4.971	+/-0.001	4.971					
	2.684	+0.005/-0.000	2.689					
	2.748	+0.005/-0.000	2.753	~				
	2.884	+0.005/-0.000	2.889					
	3.019	+0.005/-0.000	3.024					
	3.163	+0.005/-0.000	3.168					
	3.308	+0.005/-0.000	3.313					
	3.429	+0.005/-0.000	3.434					
E B	2.990	+0.005/-0.000	2.991					
SIDE	2.618	+0.005/-0.000	2.623					
	0.200	+/-0.010	0.200			1		
	R0.063	+/-0.010	R0.063					
	R0.500	+/-0.010	R.500					
	4.971	+/-0.001	4.971					
	124.09	+/-0.020	124.070					

Measured by:	Audited by:	Ep	Prototype Approval:	N/A
Date: 06/02/0/	Date:	06/02/01	Date:	N/A

Rev Date C	Change		Revised by	Approved
A 04.06.16 N	Vew Issue (F	P/O D412-664-203)	KJ/JLM	





	DESIGN	Рн	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
	CHECKE	D WAR	APPROVED	DRAWING NO. REV. B
		MIT	1	D412-664-243 SHEET 1 OF 3
	DATE	***************************************	***************************************	TITLE SCALE
j	05.02	04		CROSSTUBE ASSEMBLY (412 HI AFT) NTS
	Α		01.10.17	NEW ISSUE
	В		05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES

RETURN TO ENG INEERING

UNCONTROLLED COFY

SUBJECT TO AMENDMENT

WITH INCIT NOTICE



Qty	Part Number	Description
Χ	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
1	D6009-129	CROSSTUBE
1	D2896-1	SUPPORT
2	D2856-600-1009	ABRASION STRIP
1	D2856-600-1087	ABRASION STRIP
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP
2	D3189-1	CHAFING SHIELD SHOP COI

GENERAL NOTES:

TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED. 1)

2) MATERIAL: MANUFACTURED FROM D6009-129

FINISHED LENGTH = 124.09±0.020

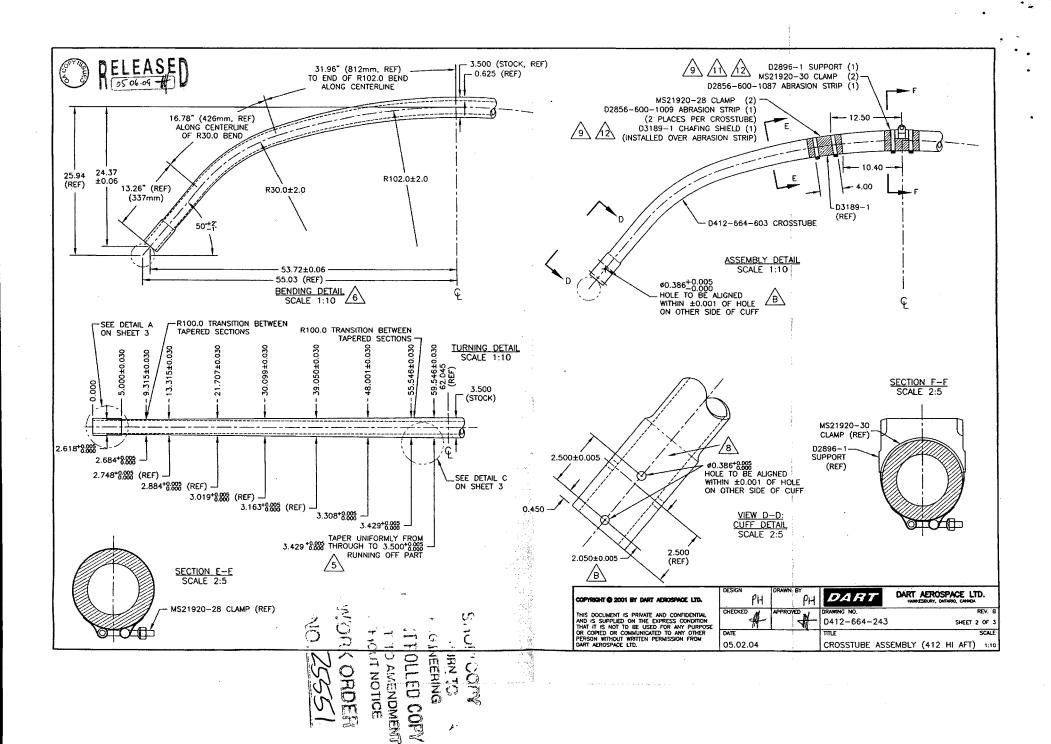
FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

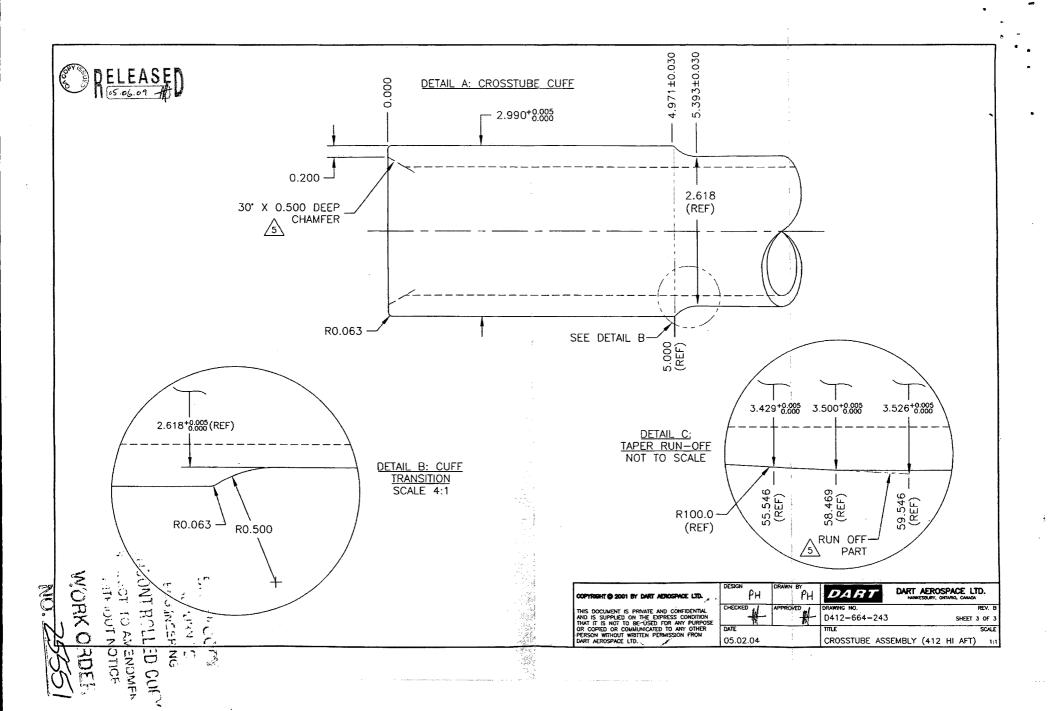
PAINT OUTSIDE PER DART 005 4.2

- PART IS SYMMETRIC ABOUT CENTERLINE. 4)
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. 7)
- SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- INSTALL D2856-600-1009 AND D2856-600-1087 ABRASION STRIPS WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2896-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY, CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) IT IS OPTINAL TO TO SEAL EDGES OF SUPPORTS USING SIKAFLEX-241/291 SEALANT.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

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angle angle (49.75) 53.75 53.6875-107, 4375

DATE: 06:02-15

DESCRIPTION: 0412-664-203

BATCH NO: 25551

DRAWING: <u>0412-664-243</u>

н: 24.37

1/2 SPAN: 53 77

TOTAL SPAN: 107.44

ANGLE:____50

00.15

24.1875

Steben



 $N_{\bar{0}}$ W.O. 33580

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

AIRCRAFT / COMPONENT INFORMATION

n	r	_	S	rn	۸٦	rı	n	NI.
п	r	u		ıη	ΑI		u	IV.

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

INSPECTION REQUIREMENTS

Carry out FPI of (3) cross tube (external surface) as per ASTM E-1417-05 (and the Dart QSI 038,
Section 4.1.1 (on file at client) - parts delivered to HeathAir.	,
Qty (3) P/N D412-664-203 S/N's B25550, B25551 & B25549	
3	
RADIOGRAPHY ULTRASONIC PENETRANT MAGNET	IC PARTICLE EDDY CURRENT
INSPECTION REPORT	
Fluorescent penetrant inspection was performed in accordance with the abo	ve requirements on (3)
cross tubes.	- · · · · · · · · · · · · · · · · · · ·
Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is r	nore sensitive)
Ardrox 970P25E Batch #04B503.	,
(3) cross tubes PASSED inspection.	
/	
-THE MAINTENANGE-DESCRIBED-ABOVE HAS BEEN-PERFORMED IN AGGORDANGE WITH	
THE APPLICABLE STANDARDS OF AIRWORTHINESS	DATE February 20, 2006
INSPECTED BY:	INSPECTION Not Required
	STAINTE(S)
CUSTOMER INFORMATION	
CUSTOMER Dart Aerospace	P.O. NUMBER 00000609
	•
ADDRESS:	CONTACT NAME:~
	:

LABOUR MATERIALS @ TRAVEL EXPENSES @ GST HOTEL EXPENSES @ **PST**

INVOICE NO.

TOTAL \$



HeathAir

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3 Tél: (514) 636-1000 • Fax: (514) 636-0031 W.O. Nº 33580

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

		144	THE REPORT OF THE PERSON	19 /4	
	7. Tel (0.0)			181	
REGISTRATION:	MODEL/TYPE:		SERIAL NUM	BER:	
TOTAL HR/LDG	OPERATED BY:		BASE	DAT.	1
		Mileoniae			
				1.1. 75 ()	21.038
Carry out Section 4	FPI of (3) cross tube (external sur .1.1 (on file at client) - parts delive	face) as per AST red to HeathAir.	M E-1417-05	and the Dari Q	51 050,
Qty (3)	P/N D412-664-203 S/N's B2	5550, B25551 &	B25549		
[RADIO	GRAPHY ULTRASONIC	PENETRANT	MAGN	ETIC PARTICLE	EDDY CURREN
		ailon ja Euc			
	70,000				
cross tul Note:	cent penetrant inspection was performed. A Level 3 penetrant was substituted. Ardrox 970P25E Batch #04B503. Is tubes PASSED inspection.				
	THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFO. THE APPLICABLE STANDARDS OF AIRWO	RMED IN ACCORDANCE WIT DRTHINESS	Ч	DATE: Febru	ary 20, 2006
	INSPECTED BY SPETCHE	- 12	-	INSPECTION NOT STAMP(S) NOT	: Required
CUSTOMER:		MERINEOFA	President de la companya de la compa	P.O., NUMBER: CONTACT NAME:	00000609
				\$	الان ما الدين المادين المادين المادين المادين المادي
LABOUR	<u>@</u>				
MATERIALS TRAVEL EXPENSES	@ @			GST	
HOTEL EXPENSES	@			PST	
	INVOICE NO.			TOTAL \$	